U.S. EPA Region 8

Underground Injection Control (UIC) Program

AQUIFER EXEMPTION RECORD OF DECISION

This Record of Decision (ROD) provides background information concerning the aquifer exemption request and the basis for the aquifer exemption decision. This ROD also includes a discussion of any public comments received, and includes the recommended decision.

BACKGROUND INFORMATION

Lead Regulatory Agency: COGCC

Date of Aquifer Exemption Request: June 11, 2014 (date COGCC letter to Tom Aalto was received by EPA). [Note: An original request letter was sent to Dan Jackson on January 17, 2014. However, that submittal package did not include all necessary information and was not complete.]

For Delegated State/Tribal UIC Programs- Is this a Substantial or Non-Substantial Change to the Delegated Program? Non-substantial change

Operator: EE3, LLC

State: Colorado

County: Jackson

Field or Project Name: North Park

Is the proposed aquifer exemption connected to individual well(s) or an area permit? Individual well

If for an area permit provide the following information (or use "NA"): NA

Area Permit Name:

Area Permit Number:

Area Permit Type:

Area Permit Location:

***If for an individual well(s) permits provide the following information (or use "NA")*:**

Well Name: Vaneta 1-32D SWD

Well ID (e.g., permit number or API number): 05-057-06467

Well Location: NENE Section 32 T7N-R80W 346' FNL & 875' FEL

Well Class /Type: Class II

Well Status: Shut-in production well awaiting approval for conversion to an injection well

***For area permits or individual well(s) permits provide the following information*:**

Injectate Characteristics: Produced waters (maximum expected TDS value: 39,000 mg/L)

Aquifer to be Exempted: Dakota and Lakota Formations

Aquifer Water Quality TDS: 3,900 mg/L - 4,000 mg/L (for both Formations)

Aquifer Depths (approximate): Dakota: 8,392'– 8,440'; Lakota: 8,518' – 8,528'

Aquifer Exemption Area or Radius (AOR / ZEI): The W ½ of the SW ¼ of Section 28, the SE ¼ of Section 29, the NE ¼ of Section 32, and the W ½ of the NW ¼ of Section 33 T7N-R80W, 6th PM

Confining Zone(s): Mowry Formation shale above, and Morrison Formation below the injection zone (sources: COGCC, and USGS Bulletin 1257)

Other Known USDW(s): Unknown. There is shallow alluvium in the area that is used for drinking water wells

Water Wells Within ½-Mile (or otherwise in close proximity): There is one water well within ½ mile. The well is 200' deep.

Well Construction Information:

9-5/8" Surface casing set to 1,080' and cemented to surface

7" Production (longstring) casing set to 8,818'; top of cement at 290'

Oil and Gas Production Data: NA

Seismicity: There has been some seismic activity reported in the area approximately 12-miles away (see information /recommendations provided by Chris Eisinger, COGCC, in a memo dated June 1, 2014)

Injection Pressure Limitation: 1,335 psi

Injectate Volume Limitation: 3,000 bbls/day and a maximum allowable volume of 5,441,984 bbls over the operating life of the well

Estimated Horizontal Flow Rate and Direction in Aquifer [If the horizontal flow rate is greater than 10 ft. per year provide a written statement concerning plume migration related to the exempted portion of the aquifer]: Unknown. Not expected to be significant.

Is injectate TDS expected to be over 10X the aquifer TDS? (Y/N) Potentially. **If yes, then provide a statement concerning the potential for high density fluid flow. [If high density fluid flow is a potential issue also discuss potential mitigating factors to ensure that injectate remains in the exempted portion of the aquifer (e.g., reduce the maximum allowable volume of injectate**).] The injectate is not expected to be significantly denser than the original formation fluids. As such, there is not expected to be an issue related to potential density flow in this case.

Quality of Confining Zone(s) (e.g., any known significant continuous fractures?): There is a fault located approximately 1.3-miles to the southwest. There is no information to indicate that the injected fluid would reach the fault.

Are all wells in AOR or in ZEI properly cemented? No wells are located in the ¼-mile AOR

Pore Pressure of Aquifer (Injection Zone): Estimated by COGCC to be 3,691 psi (near normal hydrostatic pressure)

Will injection of fluids cause any original formation fluid or injectate to migrate to any known USDW? No

For Enhanced Oil /Gas Recovery Projects- Could nearby producing wells in the same aquifer potentially draw injected fluids out of the aquifer that is to be exempted beyond the area that is being proposed for exemption? [If so, then the aquifer exemption request would need to be modified. For example, the area of the aquifer to be exempted would need be modified to include, at a minimum, the closest production well to help ensure that all injectate remains in the exempted portion of the aquifer.] NA

Will injectate remain in exempted portion of aquifer? Yes

Have other similar aquifer exemptions been granted by EPA in the immediate area? No

Proximity to Other Jurisdictional Boundaries: NA

Current Use of Aquifer as a Source of Drinking Water in the Area: Shallow aquifers

Nearby Drinking Water Supplies Using Surface Water: NA

Is the area of the aquifer to be exempted known to be within the capture zone of any water wells (e.g., municipal water supply wells) in the same aquifer? [Note: If so, then the default recommendation would likely be to deny the aquifer exemption request.] No

Potential Use of Aquifer as a Source of Drinking Water in the Future: The Dakota and Lakota Formations are not expected to be used as a source of drinking water in the future due primarily to depth, water quality, and the availability of shallower higher quality aquifers for drinking water use in the area.

Well Construction and Water Transportation and/or Treatment Costs: It is estimated by COGCC that it would cost approximately $1,000,000 to drill a water well to the Dakota or Lakota Formations. The COGCC also estimated that a shallow water well in the area would cost approximately $8,000 to construct. As such, would not likely be economically practical to drill a water well to the Dakota or Lakota Formations.

Population Trends in the Area Related to Water Supplies: The population has declined in the county 2.1 % in the last few years to 1,365 residents (U.S. Census data)

Other Issues or Points to Consider: NA

BASIS FOR DECISION

Regulatory Criteria under which the exemption is requested
40 CFR 146.4

(x) **(a)** Not currently used as a drinking water source* **and**:

( ) **(b)(1)** It is mineral, hydrocarbon, or geothermal energy producing, or

(x) **(b)(2)** It is situated at a depth** or location which makes recovery of water for drinking water purposes economically or technologically impractical, or

( ) **(b)(3)** It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption, or

( ) **(b)(4)** It is located over a Class III well mining area subject to subsidence or catastrophic collapse, or

(x) **(c)** TDS is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system.

* In order for an aquifer to be considered "not currently used as a drinking water source", it must, at a minimum, not have any water wells within ¼-mile of the boundary of the area to be exempted and should not typically have any municipal water wells (which typically have relatively high pumping rates) within ½-

mile of the boundary of the area to be exempted.

**In order for the depth criteria to be used in most cases the depth of the well or the depth of the potentiometric surface in the well should typically be at least 2,000 ft. deep. If the depth of the well or the depth of the potentiometric surface is less than 2,000 ft. deep then a written justification for using the depth criteria should also be included.

PUBLIC COMMENTS

There were no public comments received by COGCC during the public comment period.

RECOMMENDED DECISION

(x) Approve

( ) Deny